

Minimally Machined HoneySiC Mirrors for Low Areal Cost and Density, Phase I

Completed Technology Project (2010 - 2010)



Project Introduction

One of the major problems perceived for Trex Enterprises chemical vapor composite silicon carbide mirrors is the cost of machining, lightweighting and polishing the mirrors. Trex proposes to demonstrate a new ceramic matrix composite honeycomb panel silicon carbide that nearly eliminates the machining and lightweighting steps. Web thickness of the new material is less than 1-mm, and core geometries (pocket depth, pocket size) are easily tailored. We will also attempt to demonstrate a breakthrough in our chemical vapor deposition process that results in conventional CVC SiC

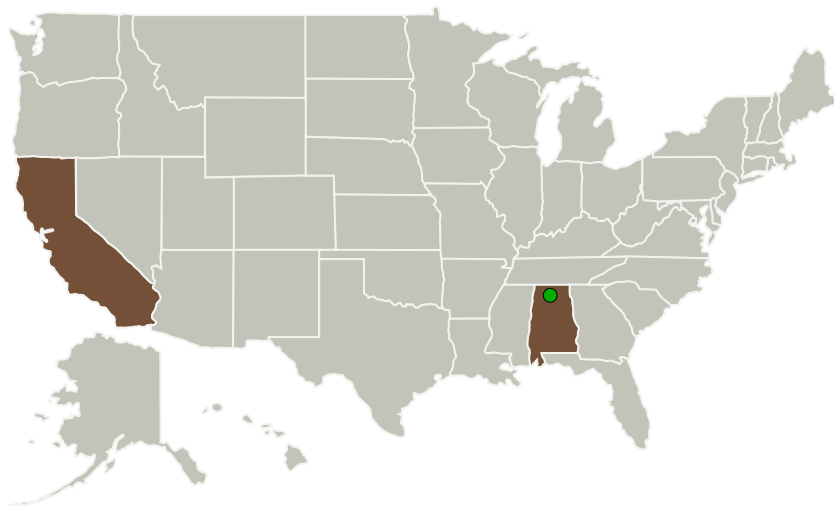
TM

facesheets that are optically figured, i.e., replicated, and which require minimal polishing. We estimate that the new material will be 3-10 times lighter than bulk silicon carbide and have a net production cost on the order of \$38K per square meter. Even at double this price it exceeds NASA's goal of \$100K per square meter. The new product will be trademarked HoneySiC

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. Phase I will start at TRL 2 (Technology concept) and mature to TRL 3 (Analytical and experimental critical function and/or characteristic proof of concept).

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Trex Enterprises Corporation	Lead Organization	Industry	San Diego, California
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	California

Project Transitions

▶ **January 2010:** Project Start

✓ **July 2010:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140018>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Trex Enterprises Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

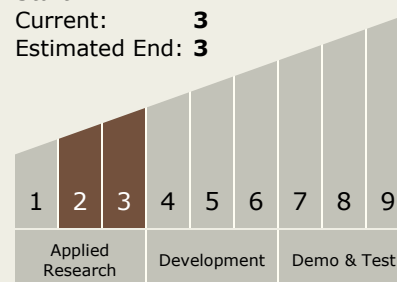
Carlos Torrez

Principal Investigator:

Bill Goodman

Technology Maturity (TRL)

Start: 2
Current: 3
Estimated End: 3



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.2 Observatories
 - └ TX08.2.1 Mirror Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System